MANAGERIAL CONTROL:
SOME TOOLS OF THE CONTROLLER

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CHAPTER I

INTRODUCTION

In undertaking a course of study in comptrollership, or controllership if you will, perhaps the first concept one encounters is that of "control." This should not be surprising you will say, in view of the fact that both words are derivatives of the French contre and rôle, meaning to check against a roll or catalogue. However, in my readings, as I explored the general concepts of comptrollership, I found many references to the words control, controls, managerial controls, administrative controls, control techniques, cost controls, and a host of other types of control. It became clear from the diversity of its use that control meant everything from a general concept to a particular technique. More important, abundant evidence pointed to the fact that controls were the means through which the controller lived and breathed, his very lifeblood, so to speak. They were the tools of his trade, the means and the method by and through which he operated, whatever his milieu. What are these magic wands so universally referred to by the initiated? What are these marvelous tools, these techniques, that enable executives of large corporations to manage their mammoth, complex industrial agglomerations so successfully? There was little room for doubt that anyone aspiring to the duties and responsibilities of a comptroller

must be expert in the techniques of the science.

It was considerations of this kind that fired my curiosity. Should I become a comptroller, a distinct possibility, a knowledge of the tools of the comptroller and their appropriate applications would be essential. And so it was that the subject of this term paper was decided. Unfortunately, despite the intensity of the desire, time and the press of other studies will not permit much more than a general review of the field of control techniques. Even so, this survey should serve as a point of departure for more detailed studies of the subject as the need becomes apparent.

We shall approach the subject of managerial control with a discussion of some of the meanings assigned to the concept of control by several authorities in the field. Following this we shall explore the purposes of and the necessity for control, the basic elements of control, and how they are related to other basic processes of administration. The second part of the study will examine some of the more major techniques of control, such as planning, budgeting, policies, standards, and reports. And finally, Chapter IV will review some of the aspects of Work Measurement as applied to government, particularly as related to budgeting and management improvement.

CHAPTER II

CONTROL CONCEPTS

Definitions

In beginning our discussion of control concepts let us distinguish between the two basic types of controls, corporate controls and administrative controls, and state that our interest lies in the area of administrative controls. Corporate controls provide a framework for a business. They are largely legal, secretarial, and custodial in nature, and involve such matters as the recording of the official minutes of Board of Directors' meetings, custody of corporate seals, and recording declarations of dividends. Administrative controls refer to all types of controls other than corporate: accounting, auditing, credit, cost, financial, industrial engineering, budgeting, and reports controls, to list but a few.[1]

Phrased simply, control is a process involving the establishment of a plan followed by appropriate steps aimed at attaining conformance. Appraisal of results follows performance, and in the event of deviation, appropriate alternate action considered. There was little significant variation

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[1] Darrell H. Voorhies, "The Treasurer and the Controller," Corporate Treasurer's and Controller's Handbook, ed. by Lillian Doris (New York: Prentice-Hall, Inc., 1950), p. 28.

from this definition among the authorities consulted. In fact one of the earliest definitions of control written some 50 years ago by the French industrialist, Henri Fayol, is difficult to improve upon:

> The control of an undertaking consists of seeing that everything is being carried out in accordance with the plan which has been adopted, the orders which have been given, and the principles which have been laid down. Its object is to point out mistakes in order that they may be rectified and prevented from occurring again.[2]

One of the most articulate of the modern writers in the field of comptrollership, James L. Peirce, Vice President and Controller of the A. B. Dick Company, emphasizes the disciplinal nature of control in his definition:

> Control might be quickly and simply defined as a disciplined effort to follow a plan or explain deviations from it. The effort referred to takes the form of self-discipline - voluntary, unified, and cooperative.[3]

In elaborating upon the meaning of control Mr. Peirce brings to our attention two facets of control which are highly significant and which we shall have occasion to comment upon later in the study. He tells us that control is simply the modern form of the old formula, "management by exception," and that control is the eternal complement to planning. Neither one is useful without the other.[4]

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[2]Henri Fayol, General and Industrial Management (New York: Pitman Publishing Corp., 1949. Original in French, 1909).

[3]James L. Peirce, "The Budget Comes of Age," The Harvard Business Review, May 1954..

[4]Ibid.

When we look at a professorial view of the meaning of control we find that William H. Newman, Samuel Bronfman, Professor of Democratic Business Enterprise, Graduate School of Business, Columbia University, expends but few words when he writes that control means assuring that performance conforms to plan. In amplifying this short definition we find that a note of tolerance creeps in when Professor Newman tells us that controlling is seeing that operating results conform to plan "as nearly as possible." And, we receive a hint of all that is involved in the control concept when we read that control is concerned with the establishment of standards, the motivation of people to achieve these standards, comparison of actual results against the standards, and the implementation of corrective action when performance deviates from plan.[5]

Control can be defined as: "...the regulating or confining of business activities, in accordance with a plan, so that the objectives of the business may be attained,..."[6] or as, "...that force which guides a business to a predetermined objective through predetermined policies and decisions."[7]

What meaning does control have for the modern day accountant? He is alerted to the fact that historical financial accounting looks to the past. He knows too that in managerial accounting the emphasis is in reverse: the past cannot be changed, so management properly looks to the future,

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[5]William H. Newman, Administrative Action (New York: Prentice-Hall, Inc., 1951), p. 4.

[6]J. Brooks Heckert and James D. Willson, Controllership (New York: The Ronald Press, 1952), pp. 17-18.

[7]James L. Peirce, "The Planning and Control Concept," The Controller, (Sept., 1954), p. 403.

referring to the past only for the guidance of experience. So, the modern accountant defines managerial control as involving, "...essentially, two things: the development of a coordinated plan of action for a period ahead and the evaluation of current results to discover and correct erroneous decisions and undesirable deviations from plan."[8]

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[8]Ronald H. Robnett, Thomas M. Hill, and John A. Beckett, Accounting, A Managerial Approach (Chicago: Richard D. Irwin, Inc., 1951), p. 517.

Purposes

It is evident from the definitions we have just reviewed that the fundamental purpose of control is that of checking performance against a predetermined plan. There appear to be at least two roads to approach this objective. One may be termed the broad organizational approach, because it places emphasis on certain principles of business organization. The other may be called the operational approach, because it is more concerned with specific operations which require controlling.

One of the basic principles of business management arises from the necessity to free executives on every level from the burden of unessential detail: the principle of delegation of authority and the concomitant creation of obligation and responsibility. Relief from the burden of detail may be achieved through delegation of authority to those capable of exercising it, yet there remains the problem of responsibility which may not be delegated. It is at this point that controls become important. Techniques must be devised and implemented whereby control is retained in the hands of those ultimately responsible at the same time that authority is delegated.[9] The basic relationship between delegation and control has been well described by Mr. E. F. Fitzmaurice, Director of Methods Planning, General Foods Corporation, New York. He writes that delegation and control are inseparable - they must always be

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[9]Paul E. Holden, Lounsbury S. Fish, and Hubert L. Smith, Top-Management Organization and Control (New York: McGraw-Hill Book Company, Inc., 1951), p. 77.

considered together. Complete clarity and understanding of this relationship of delegation and control must be present when considering the tools of control if we are to have the right tools and use them effectively.[10]

The operational approach to an explanation of the purposes of control takes us from the forest into the trees, but, once we have the general view of a subject, we must immerse ourselves in detail if we wish to master it.

So, we find that one of the purposes of control is to make certain that individual and departmental output is of satisfactory quality and volume, and that the job is completed when required. To make a profit a business must keep its costs down: controls over payrolls, materials, supplies, services, and finance help accomplish this important objective. Resources such as buildings, machinery, patents, and inventories must be carefully acquired, adequately protected, and efficiently utilized. Controls designed to meet these ends are absolutely necessary to a successful business enterprise.[11]

Let us take another view of the reasons why a business must develop and implement appropriate control techniques. We may assume that in most instances, at least, an alert, experienced management will adopt the best plan to achieve a definite objective. It still remains necessary to take action to compel events to conform to the chosen program. Programs,

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[10] E. F. Fitzmaurice, "The Essence of Control," The Controller, (November, 1950).

[11] Newman, op. cit., p. 408.

plans, courses of action are not self-achieving. Direction must be applied. People must be prevailed upon in the manner most appropriate to the situation, to act upon the program in such a way as to make it succeed. Subordinates must be instructed, directed, motivated, inspected, and corrected, until the objectives are attained. This is the purpose of control, according to Professor Billy Goetz of Antioch College.[12]

We turn again to the accountants for a succinct expression of the objectives of control. The first objective of control is a coordinated plan for the future - the forward look as expressed through the budget. The second, the development and implementation of standards of performance, sets the stage for management by exception. The third control objective, standard costs, provides knowledge of what constitutes efficient performance.[13]

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[12] Billy E. Goetz, Management Planning and Control (New York: McGraw-Hill Book Company, Inc., 1949), p. 229.

[13] Robnett, Hill, and Beckett, op. cit., pp. 518-522.

Basic Elements of Control

Just as we were able to glean from the definitions of control much about its purposes, so can we do the same with the basic elements and purposes of control. We can see from our previous discussions of purposes that the basic elements of control are (1) a plan, (2) appraisal of results against the plan, (3) action, as indicated by the appraisal. Mr. James L. Peirce agrees with this view when he says that the control process invoves: (1) the adoption of a plan, (2) reporting of actual performance, and (3) making decisions and taking action.[14] Our accountants are also directly in line when they state that the basic elements comprise: (a) the establishment of standards of performance, (b) planning of performance, (3) current knowledge of performance, and (3) corrective action.[15]

An excellent earlier analysis of the basic elements of control is generally in agreement with those we have discussed but a little more detailed. This analysis states that control is a basic process, embracing the following elements: (1) Objective - what is desired, (2) Procedure - (a) plan - how and when it is to be done, (b) organization - who is responsible, (c) Standards - what constitutes perfection, and (3) Appraisal - how well it was done.[16]

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[14] Peirce, "The Planning and Control Concept," op. cit.

[15] Robnett, Hill, and Beckett, op. cit., p. 431.

[16] Holden, Fish, and Smith, op. cit., p. 77.

[illegible]

Professor Goetz discusses the process of control from an entirely different angle, from the standpoint of costs. He states that first we must consider control of achievement: each unit and individual of an organization is assigned tasks to perform. The question is then asked, "What did each accomplish?" Here we seem to find the element of planning in the task assignment--something is to be done. Then follows appraisal when accomplishment is questioned. From this point, however, action is interpreted in terms of cost. What did each achievement cost? Professor Goetz labels this "control of cost." Control of investment logically follows: each achievement has a cost and nearly all need capital. Professor Goetz fits together these three control elements and evolves the proposition that the process of control involves a method whereby higher organization levels can direct or control the achievements, costs, and capital utilization of lower levels.[17]

Professor Newman again emphasizes the operational aspect of control when he describes the essential steps - or elements - of control as: (1) the setting of standards at strategic points, (b) checking and reporting on performance, (3) taking corrective action.[18] The setting of standards should be related to individual responsibility, that is, we must identify the goals set (control standards) with the individual designated to accomplish the goals. Again, we note that control is closely intertwined with delegation and responsibility.

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[17] Goetz, op. cit., p. 233.

[18] Newman, op. cit., p. 408.

[illegible]

[illegible], loc. cit., p. 311.

[illegible], loc. cit., p. 312.

Relationships of Control to Other Basic Processes of Administration

It has been noted already that the meaning of control can extend from a general concept to a particular control technique. Now we shall see that control signifies not only a process itself, but that it is a component part of a larger process called business administration. Writers on the subject of business organization and management, in classifying the elements of business administration, have produced differing sets of component parts. However, in one way or another, the processes of planning, organization, assembly of resources, directing, and controlling have been identified by each of them. For example, Henri Fayol lists planning, organizing, commanding, coordinating, and controlling as the five phases of administration.[19]

As one of the phases of administration, control is much dependent upon the other elements, so much so in fact that it is difficult to delineate separately. For example, the development of goals is an essential part of the planning process, but the selfsame goals may be the standards of control. So, we can say that control as part of a total process is closely interrelated to the other elements of administration, but that its functions can be separated out and studied as one of the basic elements of business organization and management.

One more point remains to be mentioned. In the evolution of the major elements of management, control was the first

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[19]Fayol, op. cit.

[illegible] of Chemical or Other Basic
Processes of Industrial[illegible]

It has been argued already that the doctrine of control and reduced [illegible] a [illegible] regulation [illegible]. Due to small or zero [illegible] may make a private [illegible], may give it [illegible] a [illegible] [illegible] [illegible]

to emerge, its significance having been recognized in the early corporations in the provision for bookkeepers and auditors of accounts. Therefore, principles of control developed earlier than those for planning and the other phases.[20]

To summarize our discussions of control concepts up to this point, we can say that control is a process based upon plan followed by appraisal and corrective action, if indicated. The fundamental purpose of control is to provide a means of appraising performance against a predetermined plan. Its basic elements are a plan, appraisal of results, and action. And, finally, it is one of several closely related elements in the larger process of business administration.

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[20] Voorhies, op. cit., p. 4.

CHAPTER III

MEDIA OF CONTROL

Planning, Policies, and Organizational Structure

We are now ready to look at some of the techniques of control. We shall attempt to obtain a comprehensive idea of some of the media of control available to the controller by briefly describing a few of these tools.

Planning.--Planning is a projected course of action. Because a plan maps a course to be followed, because it directs that this will be done instead of that, it becomes a control device. It restricts freedom of action by providing direction, and it also provides a criterion on which to base an appraisal of results of operations taken pursuant to the plan.

William Newman links the process of planning with control most clearly:

> Sound administration starts with a statement, or at least a clear recognition, of goals to be achieved. Each executive, from the president to the first-line supervisor, should know the aims of his particular activities.
>
> For this purpose, it is useful to express plans in terms of the results to be accomplished. The production manager, for instance may say that he plans to increase output 20 per cent; the personnel manager plans to increase the proportion of women employees; or the controller plans to issue a readable annual report by February 15. Plans expressed as results to be achieved may be called goals. Used in this broad

> sense, goals would include such things as objectives, purposes, missions, deadlines, standards, targets, and quotas.
>
> Goals serve a dual purpose in administration. They are vital links in the planning process, and they are also essential elements in the process of control.[1]

Policies.--From the point of view of management, the establishment of policies constitutes a primary instrument of control. As with planning, policies set direction; they are laws of conduct to be observed by appropriate personnel of any business entity. They are the basis for governing future action and therefore allow delegation of authority. They assure consistency and uniformity of action, and they sanction in advance decisions to be taken in repetitive situations.

Policies may be classified as basic, general, and departmental. Basic policies establish long-range objectives; general policies pertain to short-range, day to day operations; and departmental policies provide guidance to the more limited fields of operation of individual departments, divisions, etc.

To be most effective as a control device, policies should be in writing. In writing, they afford a means of checking on performance.

Organization Structure.--To make control effective, responsibility must be identified with an individual. It is through the organizational structure that this tying together is effectuated. Responsibility areas are clearly delineated, lines of authority are established, channels of communications

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[1] William H. Newman, Administrative Action (New York: Prentice-Hall, Inc., 1951), pp. 18-19.

set up through organization. Control is facilitated in two ways: (1) individuals are required to confine their activities to those areas assigned to their cognizance, and to deal with others in the organization in accordance with responsibilities assigned and set forth in the organization structure; (2) appraisal of performance, checking on results, and determination of appropriate corrective action can be more readily accomplished if the individual(s) responsible are easily identifiable.

Charts, functional descriptions, position descriptions, and manuals may be thought of as tools, limited though they may be, of control over organization.

An article by Harry B. Ailman, formerly Organization Control Coordinator, Lockheed Aircraft Corporation, has the following to say about the basic relationships between cost and budget controls and organization planning:

> There are two basic relationships between cost and budget controls and organization planning. The first is the coordinated development of the organization and the budgetary and cost control systems to produce responsibility accounting. The second is to make changes in the organization to carry out effective cost reduction programs. Each is equally important and each is a "must" in effective management today.[2]

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[2] Harry B. Ailman, "Basic Organizational Planning to tie in with Responsibility Accounting," N.A.C.A. Bulletin, (May 1950).

Forecasting and Budgetary Control

Forecasting.--Forecasting is but one of five major elements of financial planning. To help us understand its place in the over-all scheme, it will suffice to quote Allen H. Ottman, Vice President and Controller, American Hard Rubber Company:

> The five major steps in financial planning... include:
>
> 1. Establishing the goals or objectives of the business.
>
> 2. Forecasting and measuring the conditions that affect the realization of the goals.
>
> 3. Budgeting and scheduling operations in terms of the forecast.
>
> 4. Controlling operations in line with the budget.
>
> 5. Appraising results, then modifying goals, the forecast, and/or the budget as may be required.[3]

Financial planning comprises long-term planning, of which forecasting is one element, and short-term planning, of which budgeting is the principal function. We must clearly distinguish here between forecasting and budgeting.

Forecasting involves the making of estimates concerning the future of a business for relatively long periods of time, from one to five years or longer. It attempts to determine if the long-range plans of an enterprise are sound and feasible of accomplishment, and if so, to what degree. It is based on all relevant information, interpreted and modified by the executive in the light of his own judgment and experience. Budgets, on the other hand, are prepared for relatively

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[3] Allen H. Ottman, "Developing and Installing a Budget Program," Corporate Treasurer's and Controller's Handbook, ed. by Lillian Doris (New York: Prentice-Hall, Inc., 1950), p. 97.

short periods of time, not more than a year, often in terms of months and quarters. Budgets, based on forecasts, attempt to determine how a business must operate in detail to accomplish that part of the long-range plan realizable in the short period of time allotted to the budget.

Forecasts may be classified in four broad categories: (1) Economic. These measure general levels of business activity, with emphasis on the particular segment of the economy with which the business is most concerned, (2) Commodity price. These forecast the general level of activity of prices that have a bearing on the material components of the products of a company, (3) Company sales, and (4) Company financial. This type of forecasts includes profit and loss forecasts, capital expenditures forecast, and the important cash forecast.

It is evident, then, that forecasting is one of the most important control tools. It sets the stage on which the many other control tools enter, play their parts, and vanish into the wings. It is the broad outline of the play into which the author fits the individual lines of the players.

Budgetary Control.--A progressive business will lay its plans well ahead, probably five years at least. As we have noted, these long-range plans are called forecasts. That segment of the long-range plan immediately realizable during the course of three months to a year, the short-range segment, must be translated from plans to the concreteness of dollars and cents. The result of this translation is termed the budget.

If plans are carefully thought out, their reduction to the hard realities of money will occasion no great difficulty, but if this is not the case, the acid test of formulating them into a budget will quickly reveal their falsity.

Budgets may be applied to practically every phase of a business depending upon its size and complexity. Among the more common applications may be listed budgets for sales, distribution costs, production costs, administrative and financing expense, cash, capital expenditures, manufacturing and overhead expense. In addition to the income and expense type budgets there are those budgets established to meet different requirements such as flexible budgets and profit and loss budgets. The latter, since it normally covers all of the profit and loss accounts, includes almost all of the activities of a business.

We can say, then, that budgetary control encompasses these fundamental steps: (1) A statement of plans for a future period, expressed in the common denominator, dollars (or occasionally manhours, pounds of material, or other physical units), (2) Consolidation of these estimates into a well-balanced program, and (3) Comparison of actual results with the budget and adjustment of plans as shown to be necessary.[4]

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[4]Newman, op. cit., p. 429.

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Standards

A standard is a measuring device, rod, or rule, used to evaluate performance. Before the development of standard cost systems, current costs were compared to past costs, but past costs provided a good measure only if such costs were efficient, and if other conditions, such as prices, remained the same.

The scientific management movement brought forth engineering standards used in the planning of manufacturing operations. When such standards were translated into financial terms they became cost standards. Such standards are the very basis of accounting control. A standard cost is the amount that should be expended on a product or operation under normal operating conditions. It is predetermined under scientific methods, as contrasted to historical costs.

William W. Voorhees, Budget Director, H. O. Canfield Company, explains the two general types of standards in the following terms:

> There are two general types of standards: (1) current or attainable standards, and (2) basic standards. Each of these is explained below.
>
> Current or attainable standards. This type of standard reflects the performance that might be expected in the period for which the standards are set. They may be defined as the standards representing what costs should be under the prevailing circumstances....Basic Standards. These may be defined as the standards that reflect what costs are at the time the standards are set. They are charged only when there is some fundamental change in product or existing methods of manufacture. They are, in essence, a statistical index number.[5]

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[5]William W. Voorhees, "Setting Standard Costs," Corporate Treasurer's and Controller's Handbook, ed. by Lillian Doris (New York: Prentice-Hall, Inc., 1950), pp. 160-161.

Here are the advantages of standards, summarized by the four primary functions in which they are used:

1. In controlling costs: (a) Standards provide a better measuring stick of performance, (b) Use of the "principle of exception" is permitted, with the consequent saving of time, (c) Economies in accounting costs are possible, (d) A prompter reporting of cost control information is possible, (e) Standards serve as incentives to personnel.

2. In setting selling prices: (a) Better cost information is available as a basis of setting prices, (b) Flexibility is added to selling price data, (c) Prompter pricing data can be furnished.

3. In valuing inventories; (a) A "better" cost is secured, (b) Simplicity in valuing inventories is obtained.

4. In budgetary planning: (a) Determination of total standard costs is facilitated, (b) The means is provided for setting out anticipated substandard performance.[6]

Standards may be applied to individual performance, material quantity, material price, labor quantity, labor rates, manufacturing overhead expense, sales, distribution costs, administrative expense, and many other operations.

The question arises as to who should be responsible for setting standards. This responsibility, as to its details, is not centered (except in some very large companies) in one person or unit, but is usually performed by the individual or

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[6]Heckert and Willson, op. cit., pp. 20-22.

unit best qualified. One fundamental rule should be observed however. Standards should not be set by those whose performance is being measured. In practice, material quantity standards are determined by the engineers, with the assistance of the production personnel who are close to operating conditions, and by the accounting department who can furnish some of the data necessary in the computations. Labor quantity fall within the province of the industrial engineers as a general rule, helped by the time and motion study personnel, and again, by the accounting department. Selling (distribution) expense standards are best assigned to the sales research, and accounting units for setting up. In short, a careful analysis must be made in the case of each type of standard to determine just which unit of an organization is best equipped to develop the most accurate standard.

In general we can say that methods of setting standards largely consist of the application of clear thinking to the problem. More specifically, there must exist a recognition of the need for a standard of comparison. The area must then be carefully observed and analyzed in order to "get the feel" of it, then it must be isolated from other related functions in order to fix individual responsibility for the operation under study. Next, a determination of the unit of measure most applicable must be made. Once we know what measure shall be used, determination of the "one best method" is in order; perhaps a time and motion study, or past experience will be the criterion. With unit of measure and best method determined

a decision may be reached as to the tentative standard. This must be referred to those who are being measured for comment, then the tentative standard must be tested in actual operations. After all adjustments have been effected the standard is presented for final executive approval prior to implementation.

The distinction between current, or attainable, standards and basic standards has been referred to previously. Several kinds of current standards must now be discussed, ideal, normal or average, expected actual or attainable good performance standard. The ideal may be defined as representative of the best costs realizable, if all conditions are optimum, that is, prices the best obtainable, efficiency at the highest level, and sales volume and production at capacity. This is not a standard we can expect to attain, but is rather a goal. Because of this it is unsuited for cost control purposes, in that it poses an improbable objective which will always lead to an unfavorable variance. It does have application in cost reduction programs where it represents the target of highest efficiency. The normal, or average of past performance, standard represents costs that should be realized if prices paid for labor and material are normal, efficiency is normal, and sales volume and production are normal. The problem here is: "What is normal?" This is a poor measuring stick unless it is certain that past performance was free of all but normal conditions. It fails to adjust for improvements or elimination of waste, and it can be met by poor performance. The attainable good performance standard includes inefficiencies only

insofar as they are impractical of elimination. This standard can be met or bettered with efficient performance. It is set at a high level, but one that can be reached with diligent effort. This is the standard most acceptable from the standpoint of cost standards. In any event, the most important consideration in making a selection of standard types is a recognition of the peculiar needs of the business.

Standards are set for: (1) direct material, (2) direct labor, (3) variable expenses, and (4) fixed expenses. They may be developed with two different purposes in mind, for controlling costs, and for obtaining unit product costs for establishing selling prices or for other purposes.

The manner in which standards are set is a complicated subject somewhat beyond the scope of the present study. However, to better understand the problems involved in setting standards we shall examine the steps necessary to develop standards for direct material.

Three kinds of standards must be established for direct material. The first, type and quality, is the most fundamental. The type of material most suited for the job, in the grade best calculated to satisfy requirements, must be determined. The fewer materials or varieties required the lower will prices be for larger purchases, and fewer items will require storage and inventory.

When the kinds of material to form a product have been decided upon the question arises as to how much of each type and quality is required. So, standards to record "material quantity" or "material use" must be set up. Essentially this

is a problem for the engineer, and it may be a complex one or a simple one, depending upon the type of product and number and varieties of materials entering into its manufacture. Remember, we are talking about the quantity of direct material required to manufacture one unit of finished product. In making this determination allowances must be made for unavoidable losses such as waste and shrinkages. If previously it had been decided to adopt the attainable good performance (current) type of standard, allowance for waste and shrinkages would be made at the level of efficiency actually expected to prevail during the period of manufacture in which the standard is applicable.

Now the problem is to translate the quantities of each type and quality material into its dollars and cents equivalent. This is the function of the "direct material price" standard, the third standard necessary to setting direct material standards. We must obtain a price for each of the physical quantities measured. Again, if we use the attainable good performance type, we would expect to pay prices anticipated for the period during which the standard is expected to operate. Where contracts for a considerable period ahead exist, there is no problem. Otherwise, the market must be judged and an estimate reached.

So, by multiplying the price of each of the materials forming the finished product by the quantity, we obtain the direct material standard cost per unit of finished product. By adding to this the direct labor, variable and fixed costs, the total manufacturing cost of the unit becomes known.

There is a psychological problem involved in establishing and operating a standard costs system. Such systems must be operated by human beings with all their frailties and stubbornness. Constitutionally most people dislike being measured in the first place. If this natural obstacle can be overcome, the next one faced is that of convincing personnel that the standard is fair and reasonable. The Controller can do much in explaining the system to those concerned, and in patiently overcoming the obstacles sure to arise. Once the system is "sold" however, much good can be derived from its benefits.

The object of cost control is to secure the greatest amount of production from a given amount of material, labor, and facilities; the best results obtainable at lowest costs. The technique involved in the control of performance is first, the setting of standards; secondly, the recording of actual performance; and, thirdly, the comparing of actual performance against the standard as the work progresses. This last step can be further analyzed into: (1) determination of the variance between actual and expected performance, (2) ascertaining the cause, and (3) taking remedial action to bring the unfavorable costs in line with standards.

Control of costs should not rest with the Controller. Controlling costs is an operating function primarily, and not an accounting one. The Controller acts in an advisory and consultative capacity, presenting to management and operating personnel intelligently conceived reports, summarizing and

analyzing basic information. He presents facts in an understandable manner; it is up to operating personnel to take remedial action. The basic point is that cooperation at all levels is essential in the control of costs.

Reports

In describing the various media of control there is a strong tendency to call each one THE most important to the managers of an enterprise, undoubtedly because each control medium IS very important. Our present discussion of reports is certainly no exception. Because of the complexity of modern day business, top management is forced to conduct its supervision and direction over the multitudinous activities of a large concern through the medium of reports. No longer is it possible to personally review and control the operations of a business through observation, or personal direction. The language of planned future action, of control over current operations and of present financial conditions are all expressed through reports. It is therefore quite understandable to attribute the utmost significance to reports and the reporting system as a major determinant in successful conduct of business organizations.

The primary purpose of a reporting system is to provide management with a solid factual background for the establishment or modification of policy, and for the control of operations in accordance with policy. A report has been defined as a "communication in usable form to a responsible party of timely factual data for a specific purpose."[7] It is also a means of motivating management. Particular situations in need of correction may reach the attention of top management, the

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[7]Mason Smith, "Internal Reports," Corporate Treasurer's and Controller's Handbook, op. cit., p. 797.

level of supervision in a position to take decisive action, only through a report. Unless this report is properly prepared so that the reviewing executive quickly spots the unfavorable condition and understands what it represents, action may not be forthcoming as promptly as the situation demands, and losses may be the ultimate result. So, reports must tell management what it needs to know so that motivating action will follow.

Accountants have not always been too successful in presenting their reports in such a manner as to motivate management. Too often they have been satisfied with simply setting forth the figures in an impressive array of statistical tabulation, or otherwise, with little or no attempt at interpretation or highlighting of important factors. In recent years the development of the controller concept together with a wider understanding of its meaning has contributed substantially to improvement in this area. The modern, improved techniques of report presentation and interpretation are now the controller's stock in trade. He has come to understand that the controller must take the initiative in developing a better reporting system; he must not be content with presenting just those reports requested of him. Instead he must inquire into the needs of top management for information. He has learned that good reports evidence good management. Responsibility for the reporting system has generally been lodged with the controller. How successful he will be in the discharge of this all-important duty will depend largely upon his understanding of the fundamental principles of good report-

ing, and upon the extent to which he has acquired a comprehensive understanding of his own organization, its processes, procedures, and problems, and a knowledge of the eccentricities, abilities, desires, and needs of the executives who utilize his services.

Let us now examine those general principles which the controller must know and observe. They may be summarized as follows:

1. Reports should contain only essential facts.
2. Reports should be simple and clear.
3. Reports should be expressed in language and terms familiar to the executive who will use them.
4. Information should be presented in logical sequence.
5. Reports must be accurate.
6. Reports should reveal significant trends and relationships.
7. The form of presentation should be suited to the executive who will use it.
8. Reports should be timely.
9. Reports should be either self-explanatory or interpreted.
10. In general, the principle of "exception" should be followed.
11. Reports should be standardized wherever possible.
12. The report design should reflect the viewpoint of the executive.
13. Reports must be useful.

14. The cost of report preparation should be considered.
15. The care taken in preparing a report should be commensurate with its use.[8]

A report must have a specific purpose; it must reflect in it some aspect of control of an operation, or interrelate action of an individual factor to the over-all activity of the organization. It is a common failing of management to specify just what information it does require. It is in this area, as we have already mentioned, in which the controller must exercise strong initiative if a solution is to be reached. A joint and conscientious effort on the part of the controller and top management is required to the end that all information essential to operations is presented, but no more.

The importance of report simplification cannot be over-stressed. Essential facts and only essential facts should be presented in a report. It is another common failing to indicate too much detailed information, so that pertinent facts become obscured - and the point requiring attention is lost sight of entirely.

K. C. Tiffany, Vice President of Burroughs Adding Machine Company, well states the meaning of simplicity:

> Simplicity does not mean "talking down" to executives. It does not mean slurring over of details -- details are necessary for management. By simplicity, I mean the presentation of financial information in a clear manner; I mean the elimination of extraneous data, the use of facts rather than quasi interpretation, and the use of graphs instead of statistical arrays whenever feasible....

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[8] Heckert and Willson, op. cit., pp. 387-390.

> Simplicity of reporting, especially for top management, can be attained by ruthless elimination of extraneous data, through the use of schedules, or through preparation of separate reports dealing with the extraneous matters.[9]

In addition to the use of schedules and supplementary summaries to reduce detail, the needs of the user must be carefully considered. Top management customarily is concerned with comprehensive and concise reports; executives at the intermediate levels of responsibility must receive reports pertaining only to the administration of their duties. At the foremen level, the level of direct supervision, specific and detailed reporting is in order. "Operating supervisors, therefore, should receive reports concerning the effectiveness of their operations and these reports should show planned performance, actual performance and variations from plans. In order that operating supervisors may be able to use their reports for the control of future operations, it is necessary that the reports give specific information about the department reported on."[10]

Needless to say, accuracy is an essential. Nothing causes loss of confidence in the work of the controller more than evidences of errors and inaccuracies in his reports.

As a manner of presentation, undoubtedly the prime element is the necessity of calling attention to those facts requiring special notice, the application through the reporting

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[9] K. C. Tiffany, "Reports for Management," The Accounting Review, (April, 1950).

[10] Ibid.

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system of "management by exception." There are various techniques for doing this. Perhaps one of the best is the graphical form popular with many executives. Through its use deviations from normal can be vividly portrayed. Reports generally will show comparisons between actual performance and either past performances or standards. Visual aids are useful but must be carefully considered from the cost angle. The modern trend is to keep the form as simple as the subject matter permits, in order that the essential point can be readily and quickly grasped. Clear language and clear headings and captions assist in quick apprehension of meaning.

What are the factors to be considered in connection with report frequency? The first consideration, of course, is the need of management for promptness. Promptness, however, may needs be conditioned by the requirement of a representative period. A profit and loss statement, for example, could hardly be useful if it covered only daily operations. Availability of data is also a conditioning factor. In general, complete operational reports are prepared monthly, supplemented by weekly or daily reports to facilitate current control of operations.

Reports must be timely to be effective. It is a truism that reports decline in effectiveness in direct proportion to the time it takes to prepare and distribute them to their users. The controller must be cognizant of every possible device to speed up issuance of reports. Mason Smith lists the following:

1. Planning the chart of accounts and the methods of reporting basic data to fit report requirements.

2. Preparation of report forms....

3. Definite scheduling of each step in the assembling and preparation of each report to eliminate bottlenecks and duplication of effort and to provide a definite goal.

4. Presentation of preliminary reports from control accounts. These are not detailed but reflect trends and, therefore, serve a very useful purpose.

5. Determination of the order of importance of all reports and emphasis upon the individual report in accordance with its importance compared to other reports....

6. Presentation of reports as they are prepared rather than delay in order to deliver a full set.

7. Use of mechanical equipment for reproduction....[11]

Terminology used in reports must be familiar ones understandable by the recipient of the report. The report must be self-sufficient, that is, it must be able to stand on its own. This does not mean that the controller will not be afforded an opportunity to explain his reports, but the more self-explanatory the report the better. Reports must also relate facts to those responsible for the accomplishment of the facts. This is not a new concept; it has been stressed before. For control purposes, responsibility must be fixed, and the report must do it. This means that the structure of the report must follow the structure of the business. This factor not only facilitates control, but it minimizes paper work and time: the executive examines only those reports that pertain to his own

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[11] Mason Smith, "Internal Reports," Corporate Treasurer's and Controller's Handbook, op. cit., pp. 801-802.

responsibilities. Finally, in this review of the elements of good reporting, we must point out that a copy of each report should be distributed not only to an individual's superior, but also to the individual himself who is directly responsible.

Internal managerial reports may be classified into two major groups: Control reports and informational reports. Control reports are directed towards current operations and look for deviations from standards, so that prompt corrective action may be taken. Informational reports deal with trends, and analysis of special situations.

Internal reports may also be classified into four groups by nature of the report: (1) financial, (2) operating, (3) statistical, and (4) special.

Financial reports indicate the financial position of a company at a given time. The principal example of this type report is the balance sheet. It is usually prepared monthly, shows comparative data and, for internal use, is less condensed than when used for publication or in the annual report. Other examples of financial reports are the daily cash report, which is used almost universally, an Inventory Analysis report, which shows significant items of inventory by quantity and value, rates of turnover, the monthly Report of Working Capital, and the Capital Expenditures report.

General operating reports involve the use of assets, manpower, results of operations, sources, and causes of profit and loss. The Statement of Income and Expense is the prime example of this type, a report which is eagerly awaited by top management. It is the master control report, and should be submitted in preliminary form at least not later than the

fourth day after the close of the month.

Statistical reports relate company trends to trends outside of the concern. This matter of outside trends must be given serious consideration as many companies have been misled by ignoring them.

Most companies are constantly being faced with special problems. Shall a new product line be instituted? Should a foreign branch be opened? Such subjects are studied through special reports.

This section will be concluded by a brief mention of reports control. As business grows and economic conditions change the demand for new and different reports flourishes. This is as it should be, for a dynamic business will need changing patterns of reports. But a mass of reports which serve no purpose is costly from many angles. The controller should maintain close surveillance and control over all requests for new reports, and a periodic review over existing reports. Does the need still exist? Can a report be presented in a new and better way? And, do all the reports in the system reconcile? Reports control is an important segment of business management and should not be neglected.

CHAPTER IV

WORK MEASUREMENT IN GOVERNMENT

In many of the books written on management planning and control, business organization, managerial accounting, or controllership you will find either no mention, or only passing reference, to the term "work measurement." Work measurement, as conceived by the business managers of the federal government, pertains to effective management control of manpower. In the older management techniques with its emphasis, and properly so, on production processes, control of manpower largely centered in that element of cost control called "direct labor." So, we find in studying the applications of standards, measures of manpower, expressed as labor: direct labor. Other forms of labor, such as indirect labor, supervisory, and administrative labor entered the picture through overhead or "burden" calculations. Both direct and indirect labor costs become a part of the end product, the cost of the product being manufactured.

Government was faced with a different problem. A large part of the "costs" of government centered in that area of administrative costs, salaries of government workers. Here the problem was one of finding an equitable method of relating

volume of work performed with manpower utilized to accomplish it, i.e., measures of output, and measures of employee time, brought together in the form of ratios usable for performance appraisal and forecasting of requirements, manpower requirements. One of the incentives, and a powerful one, motivating the Executive Branch of the Federal Government towards developing, installing, and refining work measurement programs was the annual necessity of presenting and justifying budget estimates to the Congress.

There can be no doubt that any science in a position to contribute substantially to economy in the operations of government is of the utmost importance today. Not only is government generally growing in size and complexity; the current international situation has forced the maintenance of huge military operations of an extremely costly nature. The science of management is taking the lead in the problem of integrating numerous business techniques and programs, and by so doing is making possible greater efficiency and economy in governmental operations.

Throughout this paper we have stressed the importance of control to business administrators, and to the controller in particular. If the principal resources of an organization may be said to be the three M's, manpower, materials, and money, it may also be stated that manpower is the fundamental resource. It is at this point that the art of management must begin. Especially is this so in government, where, as we have said, so large a part of "controllable costs" lie in the realm of

of manpower. It is therefore most appropriate that significant advances in the techniques of work measurement have been accomplished by management engineers working in government.

Work Measurement in the Navy

The Navy premises its basic management control problem upon five questions contained in the following sentence: "WHERE AND WHEN HOW MANY PEOPLE WERE USED OR REQUIRED TO PERFORM HOW MUCH WORK AT WHAT COST FOR THEIR SERVICES?"[1]

The "where" of the five questions has reference to the various levels through which manpower control is exercised. The first level rests in the office of the Under Secretary of the Navy who exercises over-all control of all military and civilian personnel. The second level lies in the Bureaus and Offices (and the Commandant of the Marine Corps) who exercise control of manpower within military allowance and civilian ceiling limitations set periodically by the first level of management. This control has reference to personnel in the departments themselves and in the field activities comprising the Navy Shore Establishment. The third level is the approximately 3000 field activities, stations, air stations, depots, shipyards, etc., where control is exercised by the commanding officers within limitations fixed by the cognizant bureau or office. Within these field activities are the fourth, fifth, sixth, and seventh levels of Navy management comprising the sub-divisions of a naval shore activity. These are called functions, sub-functions, operations, and elements. A function is further defined as either a common service (common to all

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[1] SecNav Instruction 5201.1, The Navy Shore Establishment Work Measurement System; Installation Instruction No. 3; 31 July 1952.

bureaus), or substantive (peculiar to the work of a particular bureau or office).

Each field activity reports to the cognizant bureau quarterly; each bureau reports quarterly on a consolidated basis to the Under Secretary. Manpower is reported on an "average man-month" basis, which represents the 8-hour days a person either worked or was on leave times the number of regular working days in a month. The average is arrived at by summing the three months of the quarter and dividing by three. Average man-months are reported in two categories; (1) "Productive" (time actually worked), and (2) "Non-Productive" (time in a leave status). It will be noted that time reported includes both military and civilian personnel, separately.

Next we will explain two more questions of our problem -- "How many people?..." and "How much work?..." -- which gets us into some details of the manpower control system, and revolves around three basic steps.

Step 1.--We must define work areas. The "supply function" of a naval air station, for example, is a work area. The basic work unit applicable to this particular work area may be "tons of material and equipment" processed.

Step 2.--If we suppose that 462 productive man-months were used in accomplishing the whole function, and 18,000 tons were handled (workload experienced), we can say that the performance rate equals .026 man-months per ton (462/18,000). We have then related amounts of work and manpower.

Step 3.--This step puts work measurement to use in the management of and budgeting for manpower. A performance rate is selected as standard, say .025 man-months per ton. Multiply the standard rate by the tons actually handled (.025 x 18,000 equals 450 standard man-months). The difference (450-462 = -12) indicates the decrease or increase in personnel required. The standard rate is also used to obtain a utilization ratio or index, that is, 450/462 equals 97% utilization. We see, then, that we have compared performance against a standard, which is the essence of any control system.

Step three is useful to all managing levels. Step three is also invaluable at the bureau and office level in budgeting. First a forecast for the "budget year" is prepared. For example, the supply function workload for all activities under a cognizant bureau may be forecast as 400,000 tons. By applying the productive man-months performance ratio to this figure we arrive at 10,000 man-months (400,000 x .025) as the manpower requirement for the year.

In summation, we can define the Navy Shore Establishment Work Measurement System as "The basic means of defining all work areas, expressing work in tangible quantitative terms and relating amounts of work and manpower in managing of and budgeting for manpower."[2]

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[2] Ibid.

Work Measurement in Performance Budgeting

Work Measurement data is invaluable in the determination, explanation, and evaluation of personnel requirements - on the "green sheets" that are so carefully perused by the Congress. Let us suppose that the total permanent departmental personnel of a particular branch of government had been averaging in the neighborhood of 280 employees, at an annual total salary of $1,100,000. The estimate for the budget year under consideration suddenly jumps to about 800 employees at a total salary of $3,000,000. Why this sudden increase and why are 800 people now needed? This is the question that all the reviewing authorities will ask, and the appropriation subcommittee of the Congress.

The first step in explaining this increase might well be a list of the operations to be performed, each operation broken down by "estimated work volume," "estimated production rate (units per man-hr.)," "estimated man-hours," and the "estimated unit-cost of personnel." By totaling the "estimated man-hours" column, dividing by a man-year figure, we arrive at the number of personnel required. This figure multiplied by the average salary figure, will give us personnel cost.

The authorities reviewing our request, and most certainly the Congress, will wish to know how long it will take to complete the project we are proposing. Work measurement data can present this information in a concise manner. For example, if the estimated workload equals 600 units, the production rate, 20 hours per unit, and the man-hours available equals 400 hours per day, we can easily ascertain that the

man-hours required total 12,000 (600 x 20). And, 12,000 man-hours required divided by 400 man-hours available per day tells us that 30 working days will be necessary to complete the project.

Let us work through another example to illustrate the use of work measurement data in budgeting. Suppose we are the budget officer in the Bureau of Aeronautics and we wish to present the total civilian manpower requirements for the budget year. For the shore establishment, we have already determined the following functions as applicable to all: supply, industrial relations, public works, security, communications, and fiscal. We will examine the manpower requirements of each, but will use the industrial relations function for our specific example. From estimates received from each shore activity, it is determined that total workload will be 79,869 units (in this instance, personnel served). By applying the standard rate for this function of .0102, we find that 814 productive man-months will be needed. This process is repeated for all the functions and the results consolidated under the budget activity "station operations." This productive man-hour total figure is adjusted by applying the overtime and leave ratios, and reduced to "average number of people required." From the latter figure is deducted military personnel on board, and civilian requirements become known. This total is translated into dollars by multiplying by the annual basic salary of $3,500, to find the total manpower dollars required for "Station Operations." Materials and Services dollars are added to ascertain the total budget

activity dollars for "Station Operations." The same process is repeated for station overhaul and repair, research and development, and inspection offices, to find the manpower requirements for the budget activities "Aircraft Overhaul," "Research and Development," and "Supporting Equipment and Services." These manpower dollars, when added to those for "Station Operations," are channelled into the appropriation, "Aircraft and Facilities, Navy," as one manpower dollars figure, and is so presented on the "green sheets."

Work Measurement in Management Improvement

Now that we have convinced the Congress of our budget requirements for the ensuing year and have obtained the funds requested for continued operations, let us review the uses to which we can put work measurement data in management improvement programs.

Revelation and appraisal of the status of operations may be presented either in tabular or graphic form as a "Record of Monthly Production." This report will show by months, the number of work units processed during the month, and the total man-hours expended. These figures are translated into a monthly man-hours per work unit figure for each month. The trend of this latter rate will gauge for us relative efficiency of our operations.

It is important too that we keep workload and personnel in balance. We can do this by balancing man-hours required against man-hours available, for each operation, and thereby shift personnel from one operation to another as excesses or shortages in manhours are revealed.

We might want to analyze performance in comparable operations. We can do this by comparing units per man-hour for each of the several field offices in which we are interested. Where a deficiency appears we shall be careful to avoid hasty conclusions, but our figures will indicate the need for a special investigation and/or study of the situation.

Another useful device is the measurement of our personnel program to management needs. For example, suppose

we have charted on a graph our actual workload over an appropriate period, productivity, and the number of personnel actually employed to accomplish the work. If we then project an estimated workload for the future, we can, in turn, estimate personnel requirements. If an increase is indicated, what shall we do about recruitment, training, and placement of these additional employees?

Work measurement data may be used as a measure of individual or group productivity as a basis for incentive awards.

In summation, we will do well to remember that in the installation and operation of a work measurement system we must keep it simple. To summarize from the data in the pamphlet, Work Measurement in Performance Budgeting and Management Improvement, published by the Executive Office of the President, Bureau of the Budget, March, 1950, the essential steps in the installation and operation of a system of work measurement are:

Step (1): Determine the purposes to be served. What information is needed, is already available, must be obtained?

Step (2): Select the operations you want to measure.

Step (3): Select a "unit" that will indicate the amount of work performed.

Step (4): Record and report work units produced and time used.

Step (5): Provide for continuing review, to insure that your work measurement system supplies accurate, reliable, and timely data, is geared to organizational needs, and is revised as changes occur.

The success of a work measurement system depends also on participation, understanding, sustained support, recognition, and coordination at all levels of management.

SUMMARY

We have reviewed the various meanings of the concept of control, and the purposes of control techniques. We have discussed the elements of control and the relationships between control and the other basic phases of business administration. We have found that in one way or another these discussions all lead back to the simple statement that control means the establishment of a plan or standard, a comparison of performance against the plan or standard, and action, as indicated.

Some, but by no means many, of the various devices for achieving control have been described, so that we gained a better idea of what the controller has to work with -- the tools of his trade. It is apparent to us that his tools are many and varied, and that a great deal of study and application will be required to master them.

To confirm this judgment we examined in a little more detail the use to which the government, and the Navy in particular, puts work measurement systems. We found that for the relatively simple phase of management called manpower control, a complicated system has been devised which utilized work measurement data. We saw how complex a managerial control can be, but also how valuable.

Finally, we are satisfied that in comptrollership lies a great challenge. Whether we meet it only time will tell!

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